PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing: 12 April 2001 (12.04.01)	
International application No.: PCT/AU00/01209	Applicant's or agent's file reference:
International filing date: 05 October 2000 (05.10.00)	Priority date: 05 October 1999 (05.10.99)
Applicant: WEEKS, Kevin, William	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International preliminary Examining Authority on:

05 October 2000 (05.10.00)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer:

J. Zahra

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference [illegible]1wee	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International application No. PCT/AU 00/01209	International filing date *(day/month/year)* 05 October 2000	Priority Date *(day/month/year)* 05 October 1999
International Patent Classification (IPC) or national classification and IPC **Int. Cl.**[7] B21D 41/04, 47/00, 49/00		
Applicant 1. WEEKS PEACOCK QUALITY HOMES PTY LTD et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheet(s).

3. This report contains indications relating to the following items:

I	☒	Basis of the report
II	☐	Priority
III	☐	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	☐	Lack of unity of invention
V	☒	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	☐	Certain documents cited
VII	☐	Certain defects in the international application
VIII	☐	Certain observations on the international application

Date of submission of the demand 05 October 2000	Date of completion of the report 07 December 2000
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer D.G. FRY Telephone No. (02) 6283 2130

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/[redacted] 00/01209

I. Basis of the report

1. With regard to the elements of the international application:*

[X] the international application as originally filed.

[ ] the description, pages , as originally filed,
pages , filed with the demand,
pages , received on with the letter of .

[ ] the claims, pages , as originally filed,
pages , as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages , received on with the letter of .

[ ] the drawings, pages , as originally filed,
pages , filed with the demand,
pages , received on with the letter of .

[ ] the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of .

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:

[ ] the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

[ ] the language of publication of the international application (under Rule 48.3(b)).

[ ] the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, was on the basis of the sequence listing:

[ ] contained in the international application in written form.

[ ] filed together with the international application in computer readable form.

[ ] furnished subsequently to this Authority in written form.

[ ] furnished subsequently to this Authority in computer readable form.

[ ] The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

[ ] The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. [ ] The amendments have resulted in the cancellation of:

[ ] the description, pages

[ ] the claims, Nos.

[ ] the drawings, sheets/fig

5. [ ] This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report*

INTERNATIONAL PRELIM[illegible]RY EXAMINATION REPORT

Int[illegible]ional application No.
PC[illegible]U 00/01209

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-8	YES
	Claims		NO
Inventive step (IS)	Claims	1-8	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The citations of the search report are "A" category documents indicating the state of the Art. There is no disclosure of a tube end with opposed portions pressed together whilst not pressing together lateral opposed portions of the tube, the crushed regions capable of receiving a fixing element. This provides additional structural strength as compared to a tube which the entire end is crushed and abutting. Hence the invention set out in claims 1-8 satisfies the criteria for novelty and inventive step.

The invention can be used in industry and satisfies the requirements for industrial applicability.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
12 April 2001 (12.04.2001)

PCT

(10) International Publication Number
WO 01/24955 A1

(51) International Patent Classification[7]: B21D 41/04, 47/00, 49/00

(21) International Application Number: PCT/AU00/01209

(22) International Filing Date: 5 October 2000 (05.10.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PQ 3258 5 October 1999 (05.10.1999) AU

(71) Applicant *(for all designated States except US)*: WEEKS PEACOCK QUALITY HOMES PTY LTD [AU/AU]; 712-714 South Road, Glandore, S.A. 5037 (AU).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: WEEKS, Kevin, William [AU/AU]; 712-714 South Road, Glandore, S.A. 5037 (AU).

(74) Agent: PIZZEYS PATENT & TRADEMARK ATTORNEYS; P.O. Box 291, Woden, ACT 2606 (AU).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

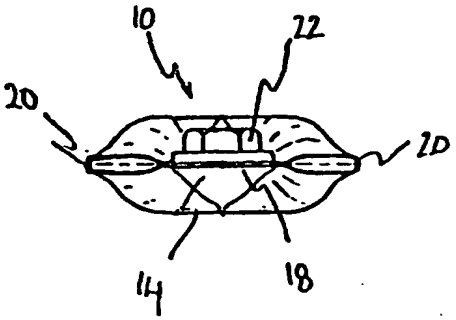
(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF CRUSHING A TUBE

(57) Abstract: A tube (10) includes a central crushed region (18) for receiving a fixing element (22) and lateral non-crushed regions (20) disposed either side of the crushed region (18) which provide additional structural strength to the tube.



WO 01/24955 A1

"METHOD OF CRUSHING A TUBE"

TECHNICAL FIELD

This invention relates to a method of crushing a tube.

The invention has particular, but not exclusive, application in preparing the end of a tube for connection with another member via a conventional fixing element such as a bolt.

The invention has particular utility in crushing the end of a web. As used herein "web" is used to refer to a strut or bracing element which extends between the upper and lower chord of a roof truss.

DISCLOSURE OF INVENTION

According to one aspect the invention resides in a method of crushing a tube, the method including:-

pressing together opposed portions of the tube such that the opposed portions abut to define a land which is adapted to receive a fixing element, wherein opposed lateral portions of the tube adjacent the land do not abut but rather define sub-tubes which straddle the land and which extend lengthwise of the tube.

According to another aspect the invention resides in a method of forming a flattened region in a tube, the method including pressing together opposed portions of the tube, whilst not pressing together lateral opposed portions of the tube.

According to another aspect the invention resides in a method of forming a flattened region in a tube, the method including selectively pinching opposed portions of the tube together such that the opposed portions of the tubes abut at a central location and such that lateral sub-tubes are defined which straddle the pinched portion.

According to another aspect the invention resides in a method of forming a land on a tube, the method including:-

compressing opposed peripheral portions into abutment to define the land, such that lateral ribs extend along either side of the land, the ribs being formed by the portions of the tube adjacent the abutting portions which define the land.

According to another aspect the invention resides in a method of crushing a tube, the method including:-

crushing the tube between a pair of opposed crush members, at least one of the crush members being substantially narrower than the corresponding dimension of the tube and engaging the tube in a substantially central location whereby a central crushed region is defined between a pair of lateral non-crushed regions, said crushed region being adapted to receive a fixing element.

According to another aspect the invention resides in a tube including a crushed region wherein opposed portions of the tube have been crushed together to abut and define a land which is adapted to receive a fixing element, the tube further including longitudinally extending non-crushed regions located laterally either side of the crushed region.

According to another aspect the invention resides in a tube including:-

a land at an end of the tube formed by compressing opposed peripheral portions of the tube into abutment, and

ribs extending along either side of the land and formed by the portions of the tubular member adjacent the abutting peripheral portions.

BRIEF DESCRIPTION OF DRAWINGS

Reference will now be made to the accompanying Figures which illustrate preferred embodiment of the invention and in which:-

FIG 1 is a plan view of a tube having a crushed or flattened end;

FIG 2 is a frontal elevation of the tube of FIG 1;

FIG 3 is a right side elevation of the tube of FIG 1 with a bolt head present;

FIG 4 is a right side elevation of the tube of FIG 1 with the bolt head absent; and

FIG 5 is a right side elevation of the tube of FIG 1 with the nut and bolt present and with the tube fastened to a planer surface.

BEST MODE

Referring firstly to FIG 1, there is shown in plan a metallic tube 10. Tube 10 may be, for example, a web which in use extends between the upper and lower chords of a roof truss.

Tube 10 is originally formed from a planer sheet of material which is folded about a longitudinal axis to define the tube with an overlapping longitudinal seam 12 as best shown in FIG 2.

The seam may be welded, riveted, glued or fixed by any known means. However, the preferred embodiment utilises an integral stitching method which swages together material in the overlapping seam region.

With reference to FIG 2, it will be noted that the end of the tube is tapered in frontal elevation. Furthermore, referring to FIG 1, a substantially triangular region 14 is more aggressively tapered and is pressed together into an abutting relationship adjacent the end of the tube.

Referring to FIG 3, it will be noted that in a central region 18 the opposed peripheral portions of the tube are crushed together so as to be abutting and planer. In contrast, open sections 20 are defined either side of the central crushed region 18. Each of the open sections 20 defines a sub-tube or rib which extends longitudinally of the tube 10 either side of the central crushed region 18.

The central crushed region 18 is adapted to receive a fixing element by virtue of one or more punched holes 16. As shown in FIG 3, the punched hole 16 receives a fixing element in the form of a nut and bolt arrangement 22.

The central crushed region 18 provides a flattened land which is adapted to receive a conventional fixing element such as nut and bolt arrangement 22. In contrast, the lateral non-crushed regions 20 provide additional structural strength as compared to a tube in which the entire end of the tube is pinched into an abutting relationship.

Referring now to FIG 5, it will be noted that when the tube is fastened a planer surface (eg the upper or lower chord of a truss), the end of the tube is deformed in that ribs or sub-tubes 20 are deformed upwardly in a wing-like manner by virtue of the engagement of the underside of the tube with the planer surface of the chord. It will be appreciated that upward wing-like deformation of the sub-tubes 20 occurs under load, ie. the bolt is under tension as it is tightened. This results in a secure joint between the tube and chord.

It will, of course, be realised that the above has been given by way of illustrative example of the invention. Any variations, modifications, or omissions, as would be apparent to persons skilled in the art, are deemed to fall within the broad scope of this invention.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A method of crushing a tube, the method including:-

pressing together opposed portions of the tube such that the opposed portions abut to define a land which is adapted to receive a fixing element, wherein opposed lateral portions of the tube adjacent the land do not abut but rather define sub-tubes which straddle the land and which extend lengthwise of the tube.

2. A method of forming a flattened region in a tube, the method including pressing together opposed portions of the tube, whilst not pressing together lateral opposed portions of the tube.

3. A method of forming a flattened region in a tube, the method including selectively pinching opposed portions of the tube together such that the opposed portions of the tubes abut at a central location and such that lateral sub-tubes are defined which straddle the pinched portion.

4. A method of forming a land on a tube, the method including:-

compressing opposed peripheral portions into abutment to define the land, such that lateral ribs extend along either side of the land, the ribs being formed by the portions of the tube adjacent the abutting portions which define the land.

5. A method of crushing a tube, the method including:-

crushing the tube between a pair of opposed crush members, at least one of the crush members being substantially narrower than the corresponding dimension of the tube and engaging the tube in a substantially central location whereby a central crushed region is defined between a pair of lateral non-crushed regions, said crushed region being adapted to receive a fixing element.

6. A tube formed according to the method of any one of claims 1 to 5.

7. A tube including a crushed region wherein opposed portions of the tube have been crushed together to abut and define a land which is adapted to receive a fixing element, the tube further including longitudinally extending non-crushed regions located laterally either side of the crushed region.

8. A tube including:-

a land at an end of the tube formed by compressing opposed peripheral portions of the tube into abutment, and

ribs extending along either side of the land and formed by the portions of the tubular member adjacent the abutting peripheral portions.

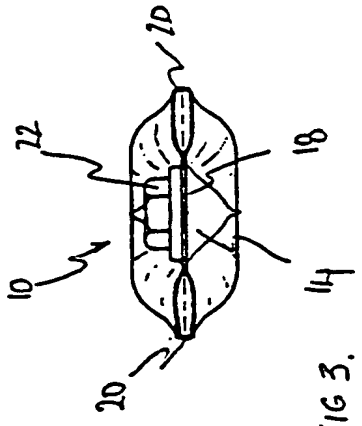


FIG 3.

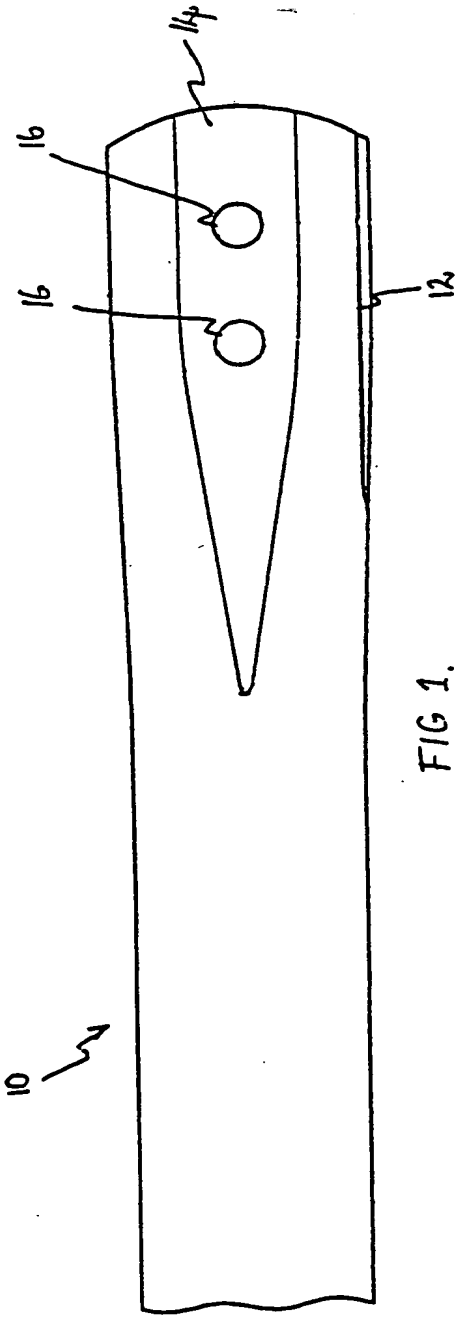


FIG 1.

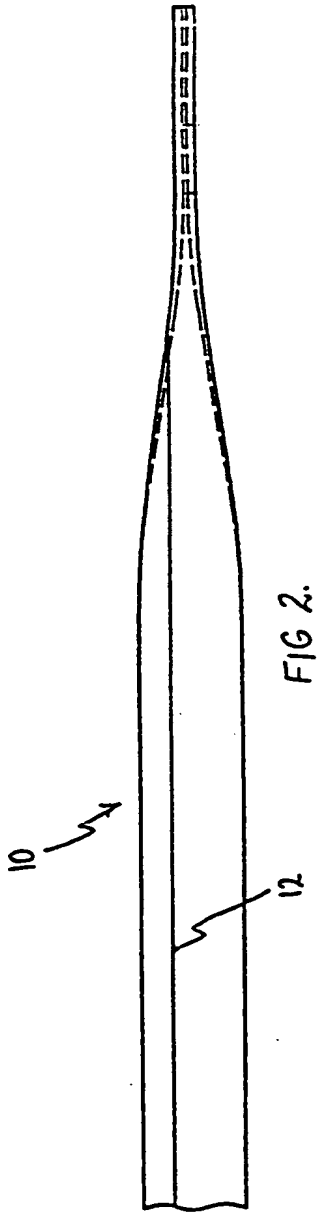


FIG 2.

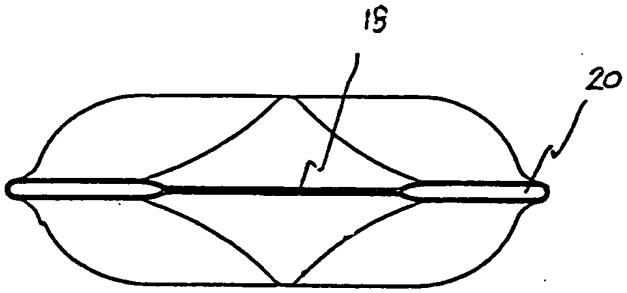


FIG 4.

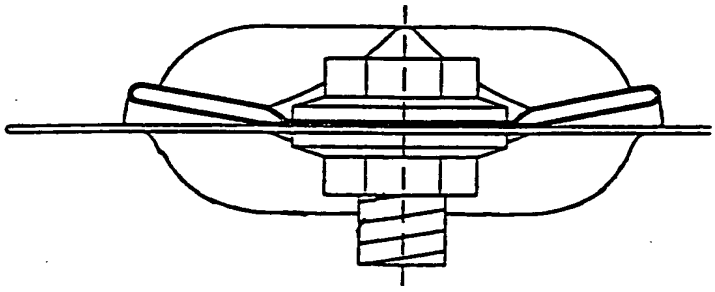


FIG 5.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 00/01209

A. CLASSIFICATION OF SUBJECT MATTER

Int Cl[7]: B21D 41/04, 47/00, 49/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC: E04B 1/19, B21D 41/04, 47/00, 49/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DWPI: flat + crush + deform + tube + crush + press + opposed

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	AU 20545/95 A (MUNERETTO) 14 December 1995 Figure 5	1-8
A	EP 522282 A (BOGEL) 13 January 1993 Entire document	1-8
A	EP 23721 A (BUCHEL) 14 February 1981 Entire document	1-8

[X] Further documents are listed in the continuation of Box C

[X] See patent family annex

* Special categories of cited documents:

"A" Document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
07 December 2000	14 DEC 2000

Name and mailing address of the ISA/AU	Authorized officer
AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No.: (02) 6285 3929	**D.G. FRY** Telephone No.: (02) 6283 2130

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 00/01209

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 402175 A (MOONEY) 12 December 1990 Entire document	1-8

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/AU 00/01209

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
AU	2054595	NONE			
EP	522282	DE	4122862		
EP	23721	AT	538679	CA	1131872
EP	402175	NONE			

END OF ANNEX

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

15

Applicant's or agent's file reference 6601wee	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International application No.	International filing date *(day/month/year)*	Priority Date *(day/month/year)*
PCT/AU 00/01209	05 October 2000	05 October 1999

International Patent Classification (IPC) or national classification and IPC

Int. Cl.[7] B21D 41/04, 47/00, 49/00

Applicant

1. WEEKS PEACOCK QUALITY HOMES PTY LTD et al

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II	☐	Priority
III	☐	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
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V	☒	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	☐	Certain documents cited
VII	☐	Certain defects in the international application
VIII	☐	Certain observations on the international application

Date of submission of the demand	Date of completion of the report
05 October 2000	07 December 2000
Name and mailing address of the IPEA/AU	Authorized Officer
AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	D.G. FRY Telephone No. (02) 6283 2130

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
T/AU 00/01209

I. Basis of the report

1. With regard to the **elements** of the international application:*

[X] the international application as originally filed.

[ ] the description, pages , as originally filed,
pages , filed with the demand,
pages , received on with the letter of .

[ ] the claims, pages , as originally filed,
pages , as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages , received on with the letter of .

[ ] the drawings, pages , as originally filed,
pages , filed with the demand,
pages , received on with the letter of .

[ ] the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of .

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:

[ ] the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

[ ] the language of publication of the international application (under Rule 48.3(b)).

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3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, was on the basis of the sequence listing:

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** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report*

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims **1-8** Claims	**YES** **NO**
Inventive step (IS)	Claims **1-8** Claims	**YES** **NO**
Industrial applicability (IA)	Claims **1-8** Claims	**YES** **NO**

2. Citations and explanations (Rule 70.7)

The citations of the search report are "A" category documents indicating the state of the Art. There is no disclosure of a tube end with opposed portions pressed together whilst not pressing together lateral opposed portions of the tube, the crushed regions capable of receiving a fixing element. This provides additional structural strength as compared to a tube which the entire end is crushed and abutting. Hence the invention set out in claims 1-8 satisfies the criteria for novelty and inventive step.

The invention can be used in industry and satisfies the requirements for industrial applicability.